Feb. 18, 1936. R. SCHLETTER 2,031,430

THREAD TENSIONING ATTACHMENT FOR TEXTILE MACHINES

Filed Sept. 19, 1934

Fig. 1.

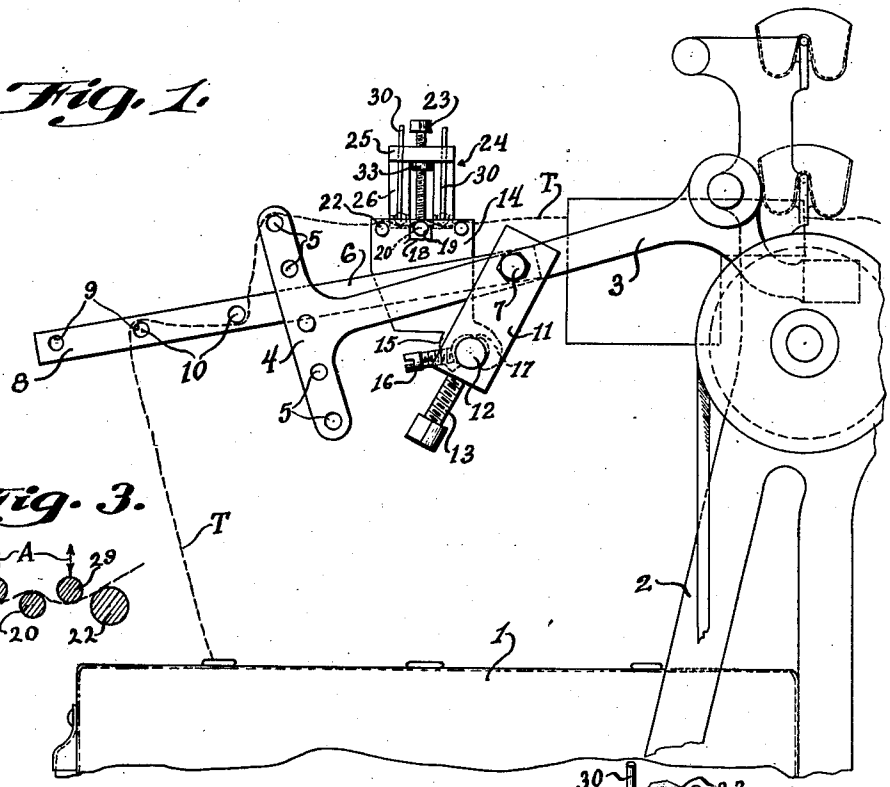
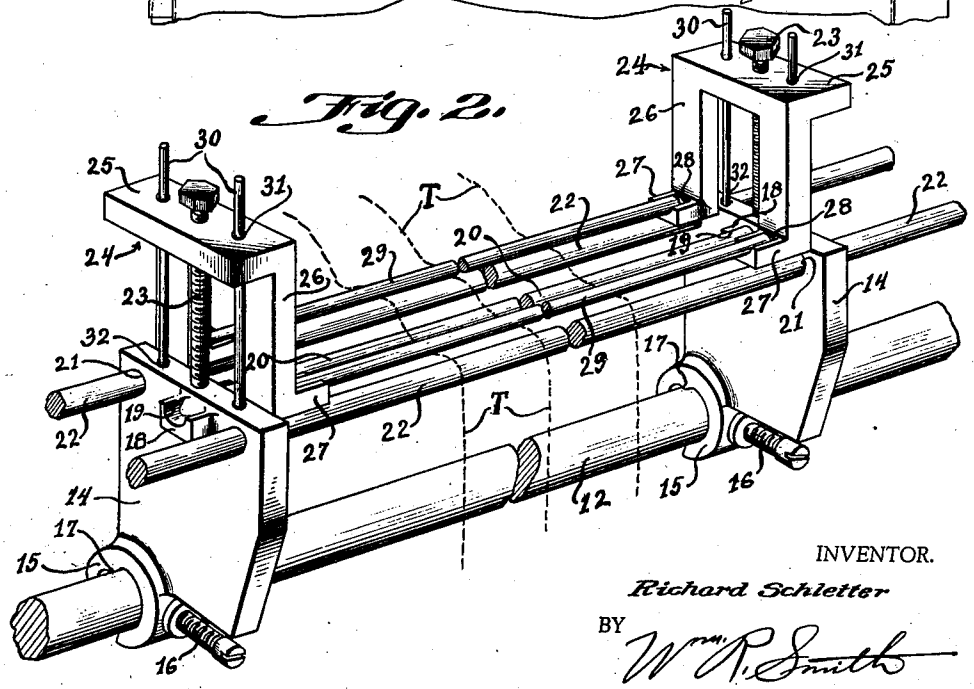


Fig. 3.

Fig. 2.



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Patented Feb. 18, 1936

2,031,430

UNITED STATES PATENT OFFICE

2,031,430

THREAD TENSIONING ATTACHMENT FOR TEXTILE MACHINES

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Application September 19, 1934, Serial No. 744,618

6 Claims. (Cl. 66—146)

The present invention relates to a thread tensioning attachment for textile machines and, more particularly, to a device for controlling the tension and drag of a plurality of silk threads or yarns, each fed to the needles of a hosiery knitting machine in predetermined repeated order by means of multiple and selectively actuated carriers to manufacture so-called "ringless" stockings.

In making "ringless" stockings in the manner aforesaid, it has been found that certain defects, such as unevenly knitted loops, "wash-board" effects, etc. occur in the finished product because of the difficulty heretofore experienced in simultaneously and uniformly controlling the tension of the individual threads utilized to form the succeeding courses in the "ringless" fabric and, therefore, this invention aims to overcome such defects by providing a device capable of acting simultaneously on all the threads to impart thereto a uniform greater or lesser tension and drag, as may be needed or desired.

The invention further contemplates the provision of an attachment of the character described embodying means adapted to positively control, through one adjustment, the individual threads travelling from the yarn cones to the carriers, thus assuring the necessary uniformity in the tension and drag of the several threads, which is essential for the proper laying thereof to produce evenly knitted loops throughout the fabric.

Another important object of the invention resides in the provision of means particularly devised to adjust simultaneously the tension of all the threads utilized over one section of a hosiery knitting machine whereby said threads may be uniformly acted upon to vary the tension imparted thereto.

Still another object of the invention resides in the provision of a thread tensioning attachment capable of maintaining the threads separate and apart, thus obviating the possibility of their entanglement and also capable of training the threads in a straight course while passing from the cones to the knitting machine and, accordingly, preventing them from curling upon themselves, as is the case especially with highly twisted yarns.

It is also among the desired features of the invention to provide an attachment for simultaneously controlling and adjusting the tension of a plurality of threads as they are being drawn from their cones onto the knitting machine, said attachment having a simplified construction and adapted to be readily and easily mounted upon the usual knitting machine frame without necessitating material changes in the construction of the latter.

Other important objects and advantages of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by those skilled in the art, I have in the accompanying drawing and in the detailed description based thereupon set out a possible embodiment of the same. In this drawing:—

Figure 1 is a side elevation of a portion of the machine frame having my improved device mounted thereon.

Figure 2 is an enlarged detailed perspective of the thread tensioning attachment per se.

Figure 3 is a diagrammatic illustration of the rods in cross section showing their relative positioning and their action upon the threads.

Having more particular reference to the drawing wherein like characters of reference will designate corresponding parts throughout, there is shown in Figure 1 a portion of the customary yarn cone box (1) and of the usual knitting machine frame (2) to which is suitably attached a rearwardly extending bracket (3) terminating with a right angularly disposed rack (4) adapted to support thread guiding rods (5). It is to be understood that in practice a plurality of brackets, such as indicated by the reference character 3, are mounted in relatively spaced relation throughout the length of the knitting machine.

Each of the rear brackets (3) is provided with an extension bar (6) connected at one end by means of a bolt (7), or the like, to the intermediate portion of the said bracket and having its free end projected longitudinally of the latter, as indicated at 8 in the drawing. The projected free end (8) of the extension bar (6) is made with a series of relatively spaced openings (9) receiving the guide rods (10) over and around which the thread (T) is to be passed.

Also secured to the intermediate portion of each bracket (3) through the bolt (7) is a downwardly directed arm (11) carrying at its lower extremity a horizontally disposed shaft (12) suitably made rigid with said arm, for instance by means of a lock bolt (13) in screw threaded engagement with the extremity of said arm and bearing upon the adjacent portion of the shaft (12).

Received transversely upon the shaft (12) and positioned thereon in paralleling spaced rela-

tion is a pair of upstanding support bodies or blocks (14), preferably provided with an integral split bearing (15) adapted to grip the shaft (12). Lock screws (16) traversing the wall of said bearings, engage the adjacent portion of said shaft and thus fixedly secure the blocks (14). In order to further assure the positive gripping of the split bearings (15) with the shaft (12) and effectively prevent relative movement therebetween, said bearings are provided with an internal transversely extended boss (17) frictionally contacting with the shaft. In this connection, it is to be noted that the inner surface of the split bearings (15) is given a more or less elliptical outline so that a more rugged engagement may be had between the bearings and the shaft by increasing the snug contact therebetween at three definite points, that is, at the boss (17) and at the opposed split ends of bearings (15).

Disposed intermediate the width of the support blocks (14) and arranged adjacent the top edges thereof, are lateral projections (18) having gullies (19) cut therein to receive and support a rod (20), or like elements, in substantially horizontal position. Openings (21) are bored in the corner sections of the support blocks (14) and positioned on each side of the projections (18) in general alignment therewith but away therefrom to leave a space therebetween. Rods (22) passing through said openings (21) are supported horizontally thereby on the same plane with the rod (20).

Extending upwardly from the top edge of each of the support blocks (14) is a screw threaded element (23) rotatably mounted in its respective block and engageable with a slide block (24) adapted to have relative sliding movement with respect to said support block (14). For this purpose, the slide block (24) is formed with an offset wing (25) disposed to parallel the top edge of the associated support block (14) and through which passes the screw threaded element (23) so that, upon rotation of the latter, said slide block will move up and down in parallel relation with the support block. The slide block (24) further has a pair of legs (26) depending from the wing (25) and each terminating with a bearing (27) disposed substantially at right angles to the body of said legs and projecting in a direction diametrically opposed to that of the wing (25). Each bearing (27) is formed with a gulley (28) freely supporting a rod (29). The legs (26) of the slide block (24) are such as to fit between the projections (18) and openings (21) of the support blocks (14), so that they may reciprocate together with the rods (29) in relation to the rods (20 and 22) carried by the fixed support blocks (14).

In order to guide the movement of the slide blocks (24) and maintain the same in a straight line when being displaced, there is provided for each slide block a pair of pins (30) received through apertures (31) in the wing (25) on each side of the screw threaded element (23) and stationarily held within bores (32) made in the top edge of the support block (14).

A lock nut (33) received on each of the screw threaded elements (23) and disposed below the wing (25) of the slide blocks (24) serves to maintain the latter in adjusted position.

From the foregoing, it will be understood that when using my improved attachment, the thread (T) drawn from the cone within the box (1) is passed in engagement with the rods (10) carried by the extension bar (6) and then over one of the rods (5) of the rear supporting brackets (3). The thread is thereupon laid over the stationary rods (20 and 22) supported horizontally by the fixed blocks (14) and passed beneath the movable rods (29) supported by the adjustable slide blocks (24) as indicated in the drawing. Therefore, it will appear that the threads are interlaced with the stationary rods and the movable rods.

Because of this engagement of the threads with the rods, it will clearly appear, upon reference to Figure 3, that the up and down movement of the slide blocks (24) through actuation of the rotatable screw threaded elements (23) will bring the rods (29) in and out of the space between the rod (20) and the rods (22), as indicated by the arrows (A), thus forcing the thread to follow a more or less deviated course, depending upon the relative adjusted position of said rods.

This action of the rods upon the threads (T), it will be understood, will impart thereto a greater or lesser tension and drag when drawn to the carriers of the knitting machine.

It will be appreciated that the particular construction of my improved attachment makes it possible to control all the threads by a single operation, whereby the adjustment of the thread tension is made uniform and simultaneous. Further, the interlacing engagement of the threads (T) with the tension controlling rods prevents said threads from curling upon themselves and overcomes the normal tendency thereof to become tangled, since the rods (20, 22, and 29) cooperating to bear upon both sides of the threads, act to train the threads or yarn ends in a straight course of travel.

It is to be noted that the relative positioning of the various guide rods is such that the several threads or yarn ends, as they are drawn from the cones to the knitting section of the machine, will be uniform in length and, moreover, will be guided in that direction of travel which will accomplish the best results.

Manifestly, the construction shown and described is capable of considerable modifications, and those modifications that come within the scope of the claims I consider within the spirit of the invention.

What I claim is:—

1. A thread tensioning and guiding attachment for simultaneously and uniformly controlling a plurality of threads in a textile knitting machine, comprising a fixed support block carrying in relatively spaced relation a plurality of rods adapted to receive the threads thereover, a member positioned above said block carrying a plurality of rods in suspension between the rods carried by said block and above the threads, a screw threaded element rotatably mounted in said block and having screw threaded engagement with said member, whereby to displace the latter for adjustment relative to the block, and a pin on each side of said screw threaded element and extending from said block to engage the adjustable member for guiding the same in its adjusting movement.

2. A thread tensioning and guiding attachment for simultaneously and uniformly controlling a plurality of threads in a textile knitting machine, comprising a fixed support block carrying in relatively spaced relation a plurality of rods adapted to receive the threads thereover, a member positioned above said block carrying a plurality of rods in suspension between the rods carried by

said block and above the threads, a screw threaded element rotatably mounted in said block and having screw threaded engagement with said member, whereby to displace the latter for adjustment relative to the block, a pin on each side of said screw threaded element and extending from said block to engage the adjustable member for guiding the same in its adjusting movement, and a lock nut disposed upon said element and engageable with said member for maintaining the same in its adjusted position.

3. A thread tensioning and guiding attachment for simultaneously and uniformly controlling a plurality of threads in a textile knitting machine, comprising two pairs of relatively movable bodies, each pair carrying a plurality of relatively spaced paralleling rods, the rods carried by the bodies of one pair being disposed for positioning between the rods carried by the bodies of the remaining pair whereby the threads may be brought into interlacing engagement with said rods, means between said bodies of each pair for relatively displacing the same thereby causing the rods to simultaneously bear more or less upon the threads, and means carried by one body of each pair and extending therefrom for engagement with the other body of the pair to guide said bodies in their relative displacement.

4. A thread tensioning and guiding attachment for simultaneously and uniformly controlling a plurality of threads in a textile knitting machine, comprising two pairs of bodies cooperatively associated to carry in suspension a plurality of relatively spaced paralleling rods, the rods carried by the bodies of one pair being disposed for positioning between the rods carried by the bodies of the remaining pair whereby the threads may be brought into interlacing engagement with said rods, a screw threaded element rotatably mounted in one body of each pair and having screw threaded engagement with the associated body of the other pair whereby upon rotation of said element the bodies will be relatively moved, thus causing the rods to simultaneously bear more or less upon the threads, and a pin on each side of the screw threaded element and extending from one body of each pair for engagement with the other body of the pair to guide said bodies in their relative movement.

5. A thread tensioning and guiding attachment for simultaneously and uniformly controlling a plurality of threads in a textile knitting machine, comprising a pair of fixed support blocks carrying in suspension therebetween a plurality of rods adapted to receive the threads thereover, a member positioned above each of said blocks and carrying a plurality of rods in suspension between the rods carried by said blocks and above the threads, means between said block and member of each pair to adjustably displace the latter together with the rods carried therebetween, and means carried by said blocks and extending therefrom for engagement with said members to guide the same in their adjusting movement.

6. A thread tensioning and guiding attachment for simultaneously and uniformly controlling a plurality of threads in a textile knitting machine, comprising a pair of diametrically opposed relatively spaced stationary supporting blocks, a first set of rods spanning said blocks and supported thereby for receiving the threads, a slide block associated with each supporting block and mounted for movement with respect thereto, a second set of rods spanning said slide blocks and suspended thereby intermediately of the first set of rods for bearing on the threads, means between the associated blocks of each pair and operable for adjustably moving the slide blocks on the stationary blocks thereby displacing the second set of rods relatively to the first set of rods for varying the tension of the threads, and means carried by said stationary blocks and extending therefrom for engagement with the associated slide blocks to guide the latter in their adjusting movement.

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